ATOMIC ENERGY newsletter

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS, INC., 509 FIFTH AVENUE, NEW YORK 17, N. Y.

January 3rd, 1950.
Vol. 2...No. 10

Dear Sir:

Construction of atomic energy plants in 1950 in actual cash expenditures, is estimated at 10% over the 1949 outlay of about $663,000,000.00. Although approximately $700,000,000.00 will be allocated by the AEC for such plant construction in 1950, additional amounts await Congressional approval (AEN 10/25/49, p.1). In the research program for the physical sciences, the year saw about $7,270,000.00 in contracts issued for non-AEC laboratories.

Sixty-seven patents in the atomic energy and related fields (many of which have previously appeared in this LETTER'S Atomic Patent Digest), are now to be released on a royalty-free, non-exclusive licensing basis. The move is a broadening of a former AEC policy under which patent licenses had been granted only for atomic energy instruments. The patents, all government-owned, will be listed in the U. S. Patent Office's "Official Register of Patents Available for Sale". (See page 3, this LETTER, for Atomic Patent Digest.)

Supplying additional electrical capacity needed for the two new (K-29 and K-31) uranium-235 production units, now under construction at Oak Ridge, Tennessee, will be the Tennessee Valley Authority's newly-announced 250,000 KW unit, This second thermal plant (AEN 10/25/49,p.1), is to cost $37,000,000.00, and will also serve the U.S. Air Force's new Tennessee engineering center. It will be at Widow's Creek, Ala., on the banks of TVA's Guntersville Reservoir, 29 miles southwest of Chattanooga.

Using Fluorothene (a fluorocarbon plastic), as a highly resistant chemical filter; a new type of vacuum lock for inserting instruments into a vacuum system without breaking the seal; and other developments of the U.S. atomic program are among the subjects of 130 new research and technical reports now available. (Publications: see page 5, this LETTER.)

A new unit to study health hazards, inherent in devices and materials producing ionizing radiation, has now been set up by the U. S. Public Health Service (PHS). It is the Radiological Health Branch, and was established, Surgeon General Leonard A. Scheele, of the PHS, said in Washington last week, because of the recent rapid increase in the use of radioactive materials and radiation producing machines throughout the United States. (Ionizing radiation: current investigations and studies, may be found on page 4, this LETTER.)

Offering better shielding properties against ionizing radiation, than ordinary concrete, and with good strength and ease of handling, a new concrete developed by E. Creutz and K. Downes, at Carnegie Institute of Technology, Pittsburgh, shows much promise for shielding nuclear particle accelerators. The concrete is made from magnetite ore concentrate, cement, and water, and because of its more efficient shielding, will give savings in both floor space and in amount of material needed.

Subscription rates: United States, U.S. possessions, and Canada, $18.00 a year. Latin America, $20.00 a year. All other countries, $25.00 a year.
Copyright, 1950, Atomic Energy News, Inc. All rights reserved.

AT THE ATOMIC CITIES AND CENTERS IN THE UNITED STATES...

RICHLAND, Washington- A contract for the major portion of the construction work to be done at Hanford Plutonium Works during 1950 has been awarded to Atkinson-Jones Construction Co. Part of the large expansion program here (AEN 10/25/49, p.2, & 11/8/49, p.2), the work is expected to begin in the Spring, although some preliminary site preparation will get underway this month. Atkinson-Jones have handled the greater part of the construction here for General Electric Co. (the AEC plant and town operator). It is a joint firm, composed of the Guy F. Atkinson Co., San Francisco, and the J. A. Jones Construction Co., Charlotte, N. C., and was originally set up to do Navy work on Okinawa.

An estimated operating budget, for fiscal 1950, of $6,768,856.00 for Richland, will incur for this atomic town a deficit of approximately $1,377,633.00. This compares with the 1949 deficit of $2,511,565.00 . According to the community manager for G-E, the 45% decrease was affected "partially by rental adjustments, and economies in operations".

LOS ALAMOS, New Mexico- Preparations at Eniwetok Atoll for the forthcoming atomic weapons tests there (AEN 12/6/49, p.1), have drawn requests by E. B. Peterson, director of the territorial employment service in Honolulu, that Hawaiian labor be utilized in the work. Replying, the AEC's Santa Fe Operations office here cabled Peterson that Holmes & Narver, Los Angeles engineering firm now rehabilitating Eniwetok AEN 8/30/49, p.1) would cooperate with the Honolulu agency. (Santa Fe Operations has jurisdiction over the Los Alamos Scientific Laboratories, Sandia Laboratories, the Salton Sea, Calif., installation, and other atomic weapons development and engineering centers.)

ARCO, Idaho- The land-based prototype of a nuclear reactor suitable for ship propulsion, which will be built at the Reactor Testing Station under construction here, is now being developed by Argonne National Laboratory, Chicago, and Westinghouse Electric Corporation. Westinghouse work centers at its Atomic Power Division, on the site of the old Bettis Airport, near Pittsburgh. Construction of the new laboratory was begun in July, 1949, and is scheduled for completion by the summer of 1950. Funds allocated so far by the AEC to Westinghouse, under this contract, are approximately $6,000,000.00, of which about $2,600,000.00 is for operating costs, and $3,400,000.00 for capital construction costs and equipment.

Research and development work is well advanced, and detailed engineering design is scheduled to begin in the fall of 1950. Construction is expected to be underway by 1952. The unit, which will be a thermal speed reactor designed specifically to produce large amounts of heat that can be utilized for propulsion of ships, is expected to cost at least $25,000,000.00, and perhaps substantially more, depending upon the technical problems encountered.

OAK RIDGE, Tennessee- A new instrument laboratory, major step in the new $19,000,000.00 construction and improvement program at Oak Ridge National Laboratory, is to be built by H. A. Ivey, Inc., Atlanta, whose bid of $437,715.00 has been accepted. The $19,000,000.00 program will extend over 2½-years (AEN 6/7/49, p.1); renovation of research and service facilities, as well as certain utility work, is already underway, and will be completed by about June of this year. Work to be let in 1950 includes a new isotope research building, waste disposal facilities, and filter facilities for the new research area.

Sanitary engineering aspects of radioactive waste disposal were discussed last week by Dr. C. P. Straub, now at the health physics division of Oak Ridge National Laboratories, "on loan" from the Public Health Service. Dr. Straub, who spoke last week on radioactive waste disposal before the American Association for the Advancement of Science, in New York, said that burial seems to be the best method at present for disposing of solid wastes. Radioactive gases, he said, can be cleaned before discharge from chimneys by using scrubbers, filters, and electrostatic precipitators. Liquid wastes can be stored, either in diluted or concentrated form, to keep them from coming in contact with humans.

PRODUCTS, PROCESSES AND INSTRUMENTS...for nuclear work...

Uranium metal, produced by Mallinckrodt Chemical Co., St. Louis, and recently made available for non-AEC use to private research and industrial organizations in the United States (AEN 12/6/49, p.3), is now being handled by 9 chemical marketing companies, whose geographical separation gives broad U. S. availability. To date, eight organizations have obtained licenses to purchase the metal; 6 state they will use the uranium in electron microscope work. Potential purchasers should write the AEC, Licensing Division, P.O. Box 30, Ansonia Station, N. Y.

A guide to industry in selling to the military Departments--"Index of Military Purchasing Offices"--is now available in revised form. All commodities which had been assigned by November 15th last to one or more of the three Departments for centralized procurement are listed; approximately 82% of all purchases are now made under these assignments. Copies of the "Index" may be obtained from Central Military Procurement Information Office, Munitions Board, Department of Defense, the Pentagon, Washington 25, D. C.

NEW INSTRUMENTS--from the manufacturers: Model 1615 Radioactivity Demonstrator. Consists of a basic counting instrument, giving a visible neon tube flash, and an audible "click" from a loudspeaker, indicating each disintegration. Amount of radioactivity also shown by meter.--Nuclear Instrument & Chemical Co., 223 W. Erie Street, Chicago, Ill.

Master-slave Manipulators. Make it possible to execute by remote control virtually any operation human hands can do. Especially applicable for chemical operations involving radioactive materials. Developed by R. C. Goertz at Argonne National Laboratory, and to be manufactured after his design.--Central Research Laboratories, Red Wing, Minnesota.

ATOMIC PATENT DIGEST...latest U. S. & British applications & grants..

Six dockets now before the Patent Compensation Board of the AEC involve royalty fees, payments, and granting of awards for the following patents and applications: (1) U. S. Pat. 1,715,283 & 2,060,005; application no. 614,880-for electrical apparatus. Inventors: W. A. and N. P. Fletcher. (2) U. S. Pat. 2,206,654, for production of radioactive substances. Inventor: E. Fermi, assignor to G. M. Giannini and Co., Inc. (3) U. S. Pat. Application 363,313, for ore treatment. Inventor: A. Pacyna. (4) U. S. Pat. Application 469,847, for separation of isotopes. Inventor: C. E. McClellan. (5) U. S. Pat. Application 459,634, for separation of uranium isotopes by centrifugation. Inventor: H. W. Schulz. (6) Two specifications, entitled, "defense against the atomic bomb", and "improvements in atomic bombs". Inventor, F.P. Fulmer.

U. S. PATENTS GRANTED-Methods of producing hexafluorophosphoric acid, the former by reacting phosphorous oxytrifluoride with hydrofluoric acid, and the latter by mixing phosphorous pentafluoride with water. U. S. Pats. Nos. 2,488,298, and 2,488,299, issued Nov. 15th, 1949, to R. Livingston, Oak Ridge, Tenn., and W. Lange, Cincinnati, O., and assigned to Ozard-Mahoning Co.

Radiation detecting device. The cathode consists of a bank of physically separated, but electrically connected plates, in a casing; the anode is an insulated wire passing through aligned holes in the plates. Associated amplifiers feed into integration circuits and recorders. U.S. Pat. No. 2,489,133, issued Nov. 15th, 1949, and assigned to The Texas Company.

Radiation counter tube with a tubular electrode having internally, equidistant-spaced longitudinal ribs, and a central electrode extending longitudinally through the tubular electrode. U. S. Pat. No. 2,489,627, issued Nov. 29th, 1949, to F. E. Dudley, Philadelphia, Pa.

IONIZING RADIATION...investigations & notes...

The greater the amount of oxygen available at the time of exposure to radiation, the greater the radiation damage to genes, with temperature important only as it affects oxygen concentration, Dr. W. K. Baker, University of Tenn., told the American Association for the Advancement of Science, at its 116th meeting in New York last week. Dr. Baker's findings were based upon work done at Oak Ridge National Laboratory (ORNL), during which he exposed the fruit flies Drosophila melanogaster to X-rays in oxygen and nitrogen atmospheres.

In a similar study of the effects of X-rays on Tradescantia (the common spiderwort), which has large chromosones, Dr. N. H. Giles, Jr., and Dr. H. P. Riley, also of ORNL, have found that changes in the chromosones were greatest when the plant was in oxygen, and least when it was in nitrogen...The Association was also told that the effect of slow neutrons on plant tissue increases appreciably whenever the boron content of the plant is increased. A. D. Conger, of ORNL, who described the experiments, made an assessment of the visible damage on the plant chromosones by slow neutrons, as compared to X-rays.

Ten cases of cataracts, believed to have been caused by the atomic bombings in Japan, have been investigated by D. G. Cogan, and S. F. Smith, of the Harvard Medical School, Boston, and the University of Calif. Medical School, San Francisco. Ten patients (7 males and 3 females, 13 to 55 years of age) were exposed, 9 at Hiroshima, and 1 at Nagasaki; all were within 550 to 950 meters of the hypocenter at the time of exposure. (Since most persons in this zone died either from thermal or mechanical injuries, or from radiation sickness, the investigators note that because of this highly selective sampling, no prediction as to the frequency of atomic bomb cataracts can be made.) However, among 231 persons who were within 1 kilometer of the hypocenter, either in the open or in wooden buildings, 5 cases of radiation cataracts were found, while among (1000 persons) a cross-section of the survivors who were within 2 kilometers of the hypocenter, no radiation cataracts were found.

Cyclotron-produced radiation cataracts conform to the general picture of roentgen-ray and radium cataracts, a preliminary study of 10 afflicted U. S. nuclear physicists has shown. P. H. Abelson, and P. G. Kruger, of Carnegie Institute of Washington, and the University of Illinois, made the study. It is believed the cause was chronic exposure to neutrons in the range of 0-20 Mev. Noteworthy is that while periodic blood examinations were being given to the men during the exposure which led to the cataracts, in no case was there a change in the blood picture--in only two cases was there a mild epilation. Additional data on this subject is being collected by the Committee on Radiation Cataracts of the National Research Council.

RADIOISOTOPES... latest tracer uses...

Applying USP cold-cream tagged with radioactive carbon to the skin of freshly shaved rabbits, L. C. Barail, and J. C. Pescatore, of the United States Testing Co., Hoboken, N.J., have found that at no time did the cold cream penetrate the skin. Part of a study to determine the penetration of cosmetics into the skin, the investigators told the Society of Cosmetic Chemists, to whom they recently described this work, that these results do not preclude the possibility that other types of cosmetics, containing hormones, iodine, or mercury do undergo such penetration. Further work will be done on these latter types.

Using radioactive tracer techniques incorporating chromium-51, a better understanding of the mechanism of electrodeposition in chromium plating has resulted from recent studies by F. Ogburn, and A. Brenner, of the National Bureau of Standards, Washington, D. C. By tagging either the trivalent or the hexavalent chromium ion in a chromic acid plating bath with the radioactive chromium-51, it was conclusively shown that metallic chromium is deposited out of the bath from the hexavalent state rather than from the trivalent state, as had previously been suggested.

Radioactive alcohol (made from corn syrup containing radioactive carbon-14), has been used by G. R. Bartlett, and N. H. Barnet, of the Scripps Metabolic Clinic, La Jolla, Calif., to study the action of alcohol in rats. They found that 75% of the alcohol is oxidized to carbon dioxide within five hours, and that 90% of it is oxidized in 10 hours.

RAW MATERIALS...radioactive ores & other essentials for nuclear work..

UNITED STATES- Discovery of uranium minerals at Negaunee, in northern Michigan, near Lake Superior, has been reported by Jones and Laughlin Ore Company, who have been conducting extensive exploration in this area. (J&L, who are active in Canada as Jalore Mines, announced assays at Jalore running from low grade to 15.7% uranium oxide; AEN 3/15/49, p.3.) The Negaunee find is in Baraga County, 15 miles northeast of L'Anse, on the Huron river. J & L have applied for a lease of 80 acres of state owned land, around the find, and have obtained rights to explore the adjacent land, which is owned by Ford Motor Co...Leaving after two years as manager of the AEC's Raw Materials Operations Office, in Washington, D.C., Dr. J.K. Gustafson will become consulting geologist for the M. A. Hanna Co., Cleveland. Jesse C. Johnson, who has been Dr. Gustafson's deputy, will succeed him.

CANADA- A pitchblende find said to be of some promise has been reported by LaBine-McCarthy Uranium Mines, Ltd., on their 25 claim property south of the Montreal river, and three miles east of the shore of Lake Superior. The showing is said to be a foot wide, with a length of 125-feet uncovered so far...Ranwick Uranium Mines, working to the north on what may be the LaBine (above) dike, have reported encouraging results, and have sent bulk samples to Ottawa for mill tests...Acadia Uranium Mines, Ltd., has succeeded International Uranium Mining Co., Ltd., in the reorganization of the latter company, with one new share issued for each four shares in the old company. All debts of the old company have been paid, and the way is paved for re-opening the company's property at Contact Lake, Northwest Territories, scheduled for May 1st.

MEXICO- A further tightening of previous decrees regulating radioactive substances is to take effect here. Under a new bill, already approved by the Chamber of Deputies, and with expected Senate approval forthcoming, the import, export, transport or possession of radioactive substances, without government license, is forbidden. (This strengthens the Declarations of the Secretary of National Economy, of Aug. 22nd, 1945, and the Decree of Nov. 15th, 1946, concerning uranium, thorium, actinium, and other radioactive elements.)

INDIA- The Mines and Minerals (Regulations & Development) Act of 1948, which came into force the latter part of 1949, further regulates India's radioactive mineral development. Section five of the Act states terms and conditions on which certificates of approval, prospecting licenses, and mining leases may be granted or reserved. Under the Atomic Energy Act (1948) of India, uranium, thorium, plutonium, neptunium, and beryllium were declared "prescribed substances", and, as such, subject to Central Government regulation. The new regulations state the need for such Government approval, discuss foreign exploitation of India's natural resources, and foreign capital participation in the Indian mining industry, all of which now require Central Government approval.

BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Vacuum Equipment and Techniques. Edited by A. Guthrie, and R. K. Wakerling. Observations made at the University of California Radiation Laboratory during the development of high vacuum equipment for the electromagnetic separation plant at Oak Ridge. 264 pages...The Chemistry and Metallurgy of Miscellaneous Materials. Thermodynamics. Edited by Laurence L. Quill. Ten original papers on thermodynamic properties of the elements and several of their compounds. 329 pages. -- National Nuclear Energy Series; McGraw-Hill Book Co., New York.

Reports of laboratories supported by the AEC; as issued for November, 1949. (Note: Due to an error by the AEC, the reports listed for November, in our December 20th, 1949, LETTER, properly refer to October reports.) Fields covered include: Biology and Medicine, 40 reports; Chemistry, 32 reports; Engineering, 2 reports; Mineralogy, Metallurgy, and Ceramics, 3 reports; and Physics, 53 reports.--Document Sales Agency, AEC, Box E, Oak Ridge, Tenn.

Sincerely,

The Staff,
ATOMIC ENERGY NEWSLETTER

January 3rd, 1950.